The Medical School's Mission And The Population's Health

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Medical Education in Canada, The United Kingdom, The United States, and Australia

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1
Redefining the Mission of the Medical School

KERR L. WHITE and JULIA E. CONNELLY

I. Introduction

Organizational and institutional turbulence and shrinking academic budgets are buffeting medical schools in both industrialized and developing countries. Current political and public scrutiny is focused on escalating health care expenditures and on the large unexplained variations within and among countries in the rates for use of services and the appropriateness of many interventions.

In spite of medicine's breathtaking advances and a spate of efficacious interventions, societal unrest has increased, both with the medical professions's performance and with the seemingly insatiable demand for resources. Canada, the United Kingdom, the United States (Blendon 1989), and Australia are experiencing a crescendo of public dissatisfaction with their health care arrangements and implicitly with medicine's leadership. Examples of this dissatisfaction include the call for redistribution of health priorities and services in the 1978 WHO/UNICEF Declaration of Alma Ata (Director-General of WHO and Executive Director of UNICEF 1978), the renaissance of primary care and growth of "alternative medicine" movements in response to demands for early care and preventive services, the documentation of wide disparities in health status and use of health services among social classes in Britain (Black 1980), and the publication by the Organization for Economic Co-operation and Development (OECD) of international comparisons of health statistics showing huge variations in expenditures, services, and outcomes (OECD 1990).

Few weeks pass in which the popular press, radio, and television in Canada, the United Kingdom, the United States, and Australia do not carry stories about the inadequacies or costs of their respective health services. Other detailed pieces cover two divergent perspectives of health and disease that confuse the public and lead to unattainable expectations. At one extreme, high technology, now or in the near future, is touted as the source of all efficacious interventions for most bodily ills, if not "answers" for every patient's "problems." At the other extreme, emphasis is placed on the

dangers of environmental exposures, and on the need for behavioral or "lifestyle" changes, adequate exercise, and improved nutritional habits in the interests of disease prevention and health promotion. Balanced presentations that relate the two views are scarce.

In Canada, most provinces recently have established commissions to examine their health care arrangements in response to inequitable distribution of services and rapidly increasing costs. For example, the Saskatchewan Commission on Directions in Health Care has called for a "Consumer-Controlled Health Care System" with local Councils of laypersons determining priorities and allocating resources. It recommends much greater emphasis on "Community and Supportive Living Services," and creation of "an autonomous Health Analysis and Development Commission to monitor and analyze health programs and practices." This new entity is to report directly to the Provincial legislature and to local Health Councils (Saskatchewan Commission on Directions in Health Care 1990). A project entitled "Educating Future Physicians of Ontario" aims "to change medical education . . . so that it is relevant to the requirements of society. The primary objectives are

- To define the future roles of physicians in Ontario in relation to community needs, and to translate these role descriptions into educational objectives for undergraduate medical education in Ontario;
- To prepare educators in Ontario's five medical schools for helping medical students achieve the stated objectives; and
- To design new assessment tools and systems for determining the achievement of the competencies[1] of future Ontario physicians, to be used in Ontario medical schools (Task Force on the Staffing and Funding of Clinical Academic Units 1990).

In the United Kingdom, the Conservative government moving to contain costs has legislated draconian reforms designed to encourage greater efficiency by means of competition among hospitals, tighter fiscal management, and provision of global budgets for large group practices. These measures have the potential for dismantling much of that country's 40-year-old National Health Service, long held in high regard by the general public. The medical profession's traditional autonomy is to be drastically reduced with the government setting the contractual rules and standards. Henceforth there is to be less talk about "inputs" and "activities"; accountability will be determined on the basis of "clinical outcomes" (Klein 1990). All of this is to be accomplished in the absence of an adequate, population-based information system and accompanying analysis (McLachlan 1990).

Commissions spawned by the United States Congress and other bodies have advanced proposals for dealing with national health care arrangements

[1]*Competencies: knowledge, skills, and attitudes.* A term used in evaluating outcomes of educational and training endeavors.

in serious disarray. Problems with the United States' "system" have resulted in social tragedies that are rapidly becoming politically intolerable. They include the 15% or more of American citizens who have no health insurance and little access to appropriate medical care, failure to provide long-term insurance and care for the aged, and inadequate community care for the mentally ill. At the same time, the wisdom of recent attempts to improve so-called "health care delivery systems" is being called into question. These measures have included aggressive competitive market strategies, prepayment, capitation, and "incentive" bonus schemes, health maintenance organizations, and myriad other corporate innovations. More specifically, in response to gross imbalances in the provision of generalists and specialists, the majority of training funds in New York state have been shifted from specialty to primary care residencies as recommended by the State Council on Graduate Medical Education (New York State Council on Graduate Education 1988).

In Australia, the Federal government has launched a major review of its health services following recent reviews of medical (Doherty et al. 1988) and public health (White 1986) education.

The problems of health care in each of these countries have multiple origins. Society's expectations, political views on the role of government, vested interests, administrative strategies, and professional intransigence all contribute. Erosion of public trust and confidence in the medical profession are the unhappy consequences; collective disenchantment appears to be at an all-time high. For this state of affairs, the academic branch of the profession must assume much of the responsibility and now has the opportunity to provide renewed leadership. The contributions that follow, therefore, are designed to stimulate discussion and provide concrete examples of strategies for reversing these trends by responding to the public's concerns.

Loss of interest by medical faculties in the health of populations is a twentieth-century phenomenon. In the latter half of the nineteenth century, the London Epidemiological Society, consisting largely of prominent clinicians, numbered among its members such academic luminaries as Richard Bright, Sir Charles Hastings, and T. Clifford Albutt. The titles of papers read before the Society attest to the organization's broad interest in the population's health: "On the Geographical Distribution of Health and Disease in Connection Chiefly with Natural Phenomena," "Suggestions for Utilizing the Statistics of Disease Among the Poor," "On the Diseases and Injuries of Artisans and Labourers, Traceable to Their Respective Occupations," and "On the Present Position and Prospects of Epidemiological Science" (Epidemiological Society of London 1901).

In 1832, a group of America's foremost physicians with postgraduate training in France founded the Society for Medical Observation, which, like the London Society, was modeled after a similar entity organized in France by Pierre-Charles-Alexandre Louis (1787–1872), the brilliant clinician who originated the *méthode numérique*. This society foundered shortly after cre-

ation in 1908 of the American Society for Clinical Investigation, largely by physicians whose training was in German bacteriological laboratories. A subtle "paradigm shift" occurred at this juncture. Medicine's broad perspective encompassing populations and the environment, as well as individuals, was supplanted by a much narrower reductionist approach dominated by preoccupation with bacteria and the "germ theory" of disease.

Meticulous clinical observation and use of quantitative methods were superseded rapidly by intense obsession with laboratory investigations to unravel disease processes and mechanisms in individual patients. This undeniably successful strategy resulted in the biomedical revolution that eventually ensued and great benefits have accrued to society. There have been unintended negative perturbations, however, as academic medicine lost touch with the common medical problems that plague most populations. Many argue that too much of medicine's efforts have been directed at conditions of relatively low frequency. In the meantime, the study of group phenomena and of patterns surrounding the occurrence of disease in populations has waned. It is now time to redress the balance and restore the broader vision that once informed the missions of the profession and its medical schools.

For at least two decades, national and international bodies have documented inequalities in health status and health services within and among countries. They have called for "more involvement with primary care," have proposed that medical education be more "community oriented" and "population based," and have urged medical faculties to establish closer associations with "the community's health problems" and conduct more "essential health research" (Royal Society of Medicine and Josiah H. Macy Jr. Foundation 1973; Gastel and Rogers 1988; World Federation for Medical Education 1988; Commission on Health Research for Development 1990). Yet the problems persist. Grafting onto the curriculum a few lectures on statistics, epidemiology, and the environment, or hiring a few social scientists has not worked; the grafts have not taken. A much more intensive and focused effort is needed to facilitate the kinds of change that will improve the health and health care of the public. The place to start is by redefining the mission of the medical school.

II. Opportunities and Challenges

Realistically, medical schools today have little choice but to respond constructively to the population's needs; yet few elect to do so. Some schools continue to debate whether or not their faculties and students should embrace a balanced, broad view of the health enterprise that includes the population

perspective[2] as well as the individual patient–physician and biomedical per
spectives. All three, but especially the individual patient–physician and pop
ulation perspectives, are frequently linked through population medicine.
Others, however, have moved on to questions about the most useful strat
egies for achieving a balanced set of goals. If medical schools and thei
affiliated institutions are to provide appropriate types and numbers of phy
sicians to meet the population's health needs, what assumptions should gov
ern the choices, what principles should be considered, and what informatio
is needed? How are these needs to be identified and their relative importanc
measured? Who should do this? What are the respective roles of universiti
(and their medical faculties), professional organizations (colleges, accredi
ing bodies, specialty societies, and certifying boards), licensing authoritie
and governmental entities in making these choices? In particular, what i
stitutional and professional competencies are required to make medical gra
uates—and future physicians—more responsive to the citizens' perceiv
individual and collective needs? Such questions provide the rationale for t
contributions that follow.

The four countries' major medical bodies, i.e., the American, Australi
British, and Canadian Medical Associations, are dominated by practiti
ers—often generalists. Their influence on educational policy varies wit
each country but is, for the most part, modest. In the United States es
cially, and in Canada, but to a lesser extent in Australia and Great Brita
academics determine research agendas and provide leadership for m
professional colleges, specialty organizations, and associations. More o
than not, academic specialists and subspecialists control virtually all the nc
points at which critical professional decisions are made. As a consequer
decisions by faculty members and representatives of medical schools, tea
ing hospitals, and diverse credentialling bodies drive the profession's
lective response to the people's health problems and health services.
how are the health needs of the population now identified? How are
research, educational, and clinical service agendas of the medical profes
now set? All too often these tasks are defined narrowly by the facul
limited experiences within tertiary care hospitals. Rarely, at least until c
paratively recently, have medical schools begun to assess the health n
of the populations surrounding them. Rarely have their faculties deliber
attempted to design appropriate strategies to ensure that those needs are
(Eisenberg 1990).

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[2] *Population Perspective: The capacity to appreciate the determinants, ranges variations of health status and disease in the entire community*. Terms such as ulation Health, Health of Populations, and Public Health also employ the Popu Perspective as an organizing concept.
Population Medicine: The application of those concepts and methods embod such largely quantitative disciplines as epidemiology, economics, demography statistics, and in such behavioral sciences as cultural anthropology, sociolog social psychology. Population-based medicine is an analogous term.

To whom should members of a community turn when they are not satisfied with, for example, their health status, their relationships with physicians, the excessive use of technology to prolong life in defiance of the wishes of patients and their families, widespread disparities among different populations in the rates for common, and not-so-common, surgical procedures and medical prescriptions, aggressive investigative searches for low-probability conditions, inequities in the availability of health care, and the unjust allocation of scarce resources? Some look to health departments or equivalent statutory entities, while others look to medical societies and professional colleges, or to local consumer advocacy groups concerned with health matters. Pressure to attend to these problems now is increasingly directed to medical schools and their faculties.

Every physician has some responsibility to provide leadership. Academic physicians in particular have unique opportunities to assume these roles on behalf of all physicians. It is the faculty who select the students to become the physicians of the future; it is they who supervise medical education; it is they who help to shape the values and viewpoints of medical students; it is they who recruit housestaffs. Teachers' attitudes, values, and behavior, whether by intent or not, can be used to guide, broaden, or narrow their students' perspectives. As a result, each faculty member's viewpoints, priorities, and examples can support or detract from students' interest in the full range of health problems and issues society expects the profession to address.

Today, the opportunity has never been greater for medical schools and the medical profession as a whole to regain the public's trust and confidence in responding to all their medical needs and in assisting society to solve its many health problems. As a first step in understanding the origins of the profession's mandate, we need to understand that an implicit social contract exists between medicine and the public it serves. The notion of the social contract, fostered by Locke and Rousseau and expanded by Jefferson, covers many of society's unwritten agreements with those who seek to serve it. Welcome or not, medical schools are among the institutions on which the social contract is binding.

For its part, society endows the medical profession, and particularly its academic component, with enormous influence, substantial resources, unequalled status, and generous financial rewards. In turn, the profession, led by its medical faculties, can reasonably be expected to help identify, understand, and ameliorate the population's individual and collective health problems. These relationships are based on a social contract; no other profession has this mandate or these expectations. The latter's very existence seems unknown to many, as others challenge its validity.

To the extent that a social contract has existed in the minds of the medical profession's leaders, it has gradually unraveled in all four countries since World War II. Bismarck's introduction of social insurance in Germany a century ago, one of the contract's earliest tangible expressions, should have alerted the profession to its responsibilities as a major beneficiary of this

innovation. Instead, there has been a long history of resistance to governmental control of medical care payment mechanisms. But in every confrontation the profession has had to retreat sooner or later and public dissatisfaction with the profession has increased. It follows, then, that the first step in any strategy for change should be to promote collective understanding of the nature of the contractual relationship the profession has with society. Everything else follows from that. Medical faculties should accept fully society's mandate to foster more effective relationships with patients and the populations they serve. In the Chapter 2 this implicit social contract is subjected to extensive scrutiny.

Medicine, together with law, following the example set by their professional schools, must surely be one of a diminishing number of "service" professions and social enterprises that responds to the public's expectations with what some take to be an "elitist" approach. Other successful service organizations start with "market" and demographic surveys, to use commercial jargon, with opinion polls, to use political language, or with population-based or catchment area surveys, to use epidemiological terminology. A helping profession seeking to serve the people should start with careful analyses of the public's individual and collective problems, especially when it is they who do the suffering and pay the bills. The definition of the population served (for example, the municipality, county, district, province, state, nation, region, or the world) and assessment of its health problems are prerequisites for determining priorities and planning medical education, clinical research, and health services.

III. Limitations of Traditional Approaches

In most biomedical research—especially that done in clinical departments—the prevailing approach can be expressed as the unspoken right of each investigator to decide the important questions based on his or her own curiosity and interest. Granted, the investigator's curiosity drives all successful research. But, especially in clinical (as contrasted to fundamental or basic) research, should not the importance of the health problem to the population also be a major consideration? Today, in contrast to the days of the London Epidemiological Society, for example, the community's health and social problems attract the interests of far too few physicians and health care institutions, especially medical schools. There is no reason to believe that institutional responses to social need and investigator responses to scientific curiosity are mutually exclusive. Achievement of coordination and balance, however, does require that each school develop an explicit mission statement.

Medical faculties too often tend to adopt a "top-down" approach in structuring their educational, research, and service agendas. If this view is to be superseded by more person-oriented and community-based perspectives each faculty will need to consider how the relative importance of society's health

problems is to be determined. Measures will be needed for the extent of pain, suffering, and disability together with their personal and monetary costs. And each medical school will need to determine how best to use this information for setting educational, research, and service priorities. The community's health and related social problems demand much more attention than they are currently accorded by medical schools if medicine is to fulfill its part of the social contract. All this needs to be done with population-based numbers.

A wide array of population-based health statistics available internationally, nationally, and locally now enable the public and politicians to question both the authoritative and authoritarian aspects of the medical profession's role. As illustrated in Chapters 3 and 4 most of these statistics cover the nature and distribution of health problems and services. Others assess the outcomes of interventions in relation to types and appropriateness of health services. Much more information is on the way. This exponential increase in credible "health intelligence" about the relative benefits, risks, and costs of medical interventions is being published in the lay press as well as in professional journals. The notion that the medical school alone is the last court of appeal and the keeper of the "gold standard" for the profession is being challenged by those who prefer to invoke other sets of "facts" about the population's health. This shift recognizes that it is no longer valid to give greater credibility to anecdotes about "individuals"—the medical profession's patients—than to "numbers" that aggregate the population's collective problems, experiences, and health status. The numbers, or health statistics as they are known in medical circles, in the memorable words of the late Major Greenwood, the eminent British statistician, "represent people with the tears wiped off." As numeracy catches up with literacy, numbers become just as vivid indicators of the human condition as accounts of individual suffering.

The profession now has an opportunity to use this vast array of information to guide medical education and research, to design strategies for improving the health of the public, and to attend to their pressing health care needs. Balance is required both between society's needs and investigators' curiosity and between academicians' preoccupations and the duty to provide medical students with appropriate skills for coping with the full range of society's medical problems. To achieve this balance, each Faculty will need to redefine its mission, realign the tasks of its members, and, perhaps, change its composition.

The helping and caring functions of the physician have been adumbrated temporarily by the proliferation of technological procedures—many of dubious efficacy. The unquestioning trust of many patients in their personal physicians has helped to bolster the profession's belief that the public collectively has remained confident and supportive. In addition, medical schools have come to assume and expect the public's undiluted confidence and trust; they have tended to believe that they derive from this an almost limitless

authority. To restore the public's trust, medicine must reestablish itself as the public's advocate. This will require the reintroduction into medical education of population-based concepts and skills to balance those required in traditional patient–physician relationships. Such measures are most likely to foster constructive attitudes and broader perspectives in future physicians. Achievement of these objectives involves not only redefining the mission of the medical school but practical changes in the context in which medical education takes place, as well as in the priorities assigned to each component of the content. Some schools have adopted innovative, population-based, problem-oriented approaches to understanding and responding to the health and medical needs of the local citizenry and society generally. Practical examples of these strategies are discussed in Chapters 4 and 5.

IV. Contemporary Developments Favoring Change

In spite of our current problems, there are grounds for optimism. If social, financial, and political pressures are deemed insufficient, five contemporary developments in medicine are allies in the urgent quest for needed change (White 1991). Although many medical school faculties are contributing to these developments, few have formally taken inventory of those bits and pieces that presage the need for major shifts in institutional perspectives and priorities. This is especially true for the medical curriculum.

First, there is the *information revolution*. Information comes from many sources, such as observations, experiments, analyses, syntheses, books, journals, bibliographies, and statistics. All are essential if the profession is to respond appropriately to individual and collective health needs, but filters are required to do this effectively and efficiently (Hardin 1985). One filter involves the skills of critical appraisal. Based on statistical and epidemiological concepts and methods, these skills should be applied vigorously and rigorously to evaluate most types of information, especially those involving interventions and maneuvers designed to do "good." Computer searches of the medical literature, analyses of databases, and exposure to the scientific and popular media provide professionals and the public alike with ready access to medical advances and information. An avalanche of publications threatens the health enterprise with distracting noise that drowns out the few nuggets of credible knowledge and the even rarer glimpses of wisdom. In turn, it can scarcely be overemphasized that newspapers, popular magazines, radio, and television regularly carry extended pieces on medical matters. Increasingly well-informed populations ask probing questions about the efficacy, risks, availability, appropriateness, and costs of medical care.

Another filter also uses epidemiology and statistics (especially health statistics, in contrast to biostatistics) to illuminate the nature, extent, and locus of health problems. There is growing familiarity on the part of clinical faculty with the statistical methods applied to laboratory studies, but much less

familiarity with the use of statistical concepts, especially probabilistic thinking, in setting goals and objectives for education, research, and service. Health statistics are based on the adequacy and accuracy of clinical information, including diagnostic labels at all levels of care. These data elements are aggregated into the health statistics that are essential for guiding equitable resource allocation and for evaluating and managing health services.

Suitable filters can array a population's health statistics to show, for example, the rank order of population-based rates by diagnostic or problem labels and by age, sex, and occupational groupings of such measures as days in pain, days in bed, disability days, hospital days, work or school days lost, tests, prescriptions, procedures, etc. By this means, rates for both small and large geographic areas can be compared over time and place. Institutional and educational goals can then be set to respond to the target population's health problems in a timely and reasonably objective fashion. Medical faculties can now replace rhetoric and precedence with quantitative evidence as the basis for defining the school's mission. The *information revolution* is bound to extend and strengthen the scientific base of the health enterprise and hasten the need for redefining the medical schools' mission to include appropriate attention to the population's collective health problems.

The second ally is our increasing awareness that just as "information" concerns the message, "communication" concerns the messenger. Both are important—hence the need for wider and better *communication*. Reading, writing, and talking face-to-face or through computers, videos, telecommunications, and "hard copy" are means of communication. So are listening, observing, touching, counselling, and explaining. Interpersonal transactions are the core of most communication in the health field at both the individual and population levels. There is renewed interest in the patient–physician relationship and growing recognition that effective diagnosis, treatment, and management require meaningful bilateral communication. This must include physicians' awareness of the ubiquitous power of two phenomena that present-day medicine, in contrast to commerce and industry, largely ignore. The first is the Placebo Effect, i.e., the capacity of a physician's ministrations, or of any non-specific intervention, to evoke subjective and physiological responses in patients. The second is the Hawthorne Effect, i.e., the behavioral responses of patients and others to institutional or organizational "caring" in many different dimensions. Both are prerequisites for fulfilling the tasks of all health professionals. Through exposure to the humanities, many student physicians whose medical education is technologically oriented become familiar with the therapeutic powers of "hope" and "caring." They also become familiar with the extraordinary diversity of the human condition and its expression on a continuum extending from "health" to "disease." There seems little doubt that both individuals and the public are insisting that the medical profession respond more sensitively and sensibly to their perceived personal and collective needs. The prospect of improved *communication* of all types is bound to require medical schools to

redefine their missions to include concerns for populations as well as for the individuals comprising them.

The third ally is our growing knowledge of genetics and the immune system—the era of *molecular biology*. The vast (and controversial) enterprise to map the human genome is regarded as the contemporary equivalent for health of the Manhattan Project. A full assessment of the medical and social impacts of such a quantum leap in our knowledge of where we start, how we are circumscribed by our inheritance, and how we must live to achieve the potential of our "talents" is not appropriate here. Nevertheless, the implications of this project are truly revolutionary, not only for medical interventions, but also for behavioral, educational, nutritional, occupational, and especially environmental modifications. Physicians, employers, educators, the public, and politicians all will need to cope with this potentially promising new penetration into the origins, boundaries, and potentials of life itself.

To understand the genetic heritage that characterizes individual and collective health risks a population-based perspective is essential. As the human genome is mapped, molecular biology must surely turn increasingly to the study of populations. Genetic surveys of families and communities whose health status may be at risk for certain diseases will need to be conducted if the nature, extent, and prospects for prevention are to be appreciated fully. Assessment of "vulnerability factors" such as inheritance of oncogenes or genetic predisposition to major mental illnesses are examples of important applications. Further advances will mean that we can move from describing disease processes to understanding the substrate from which "good" and "ill" health arise. Of equal concern will be societal and professional debates on, for example, the ethical aspects of fetal research and genetic engineering to determine what action we take based on this accumulating knowledge. These considerations alone are bound to involve surveys of the public's views, the relative, costs, risks, and benefits of interventions as well as population-based estimates of the prevalence of the conditions under discussion.

We have long talked about host, environment, and agent, but in spite of Pasteur's pioneering efforts, the bulk of that talk in medical circles during the past half-century has been about the agents—bugs and worms. During recent decades interest has turned much more to the other two components of the triad. In addition to our genetic inheritance, there is the matter of exposure to a wide variety of animate and inanimate stimuli that condition each individual's reactions to subsequent exposures. Appreciation of the way he or she perceives and responds to these exposures and experiences may become more important than identifying the exposures themselves.

The powerful new field of psychoneuroimmunology (an unfortunately cumbersome term), aided and abetted by the neurosciences and the behavioral sciences, is now codifying both the characteristics of diverse stimuli and the pathways through which they are mediated. The nature, frequency, and perception of these stimuli are being studied at the individual level. Similarly, stimuli affecting groups of individuals, including poverty, un-

employment (or the threat of it), natural disasters, occupational stress, managerial style, domestic strife, and even the utterances of charismatic leaders, need to be measured and factored into the establishment of health priorities. "Training," and perhaps learning to "control" the immune system, is likely to increase in importance as knowledge of the factors governing it grows, but we are only at the threshold of untold possibilities. The rapidly unfolding insights provided by *molecular biology* are bound to require clarification of the medical school's mission so that studies of individual patients are related to problems experienced by entire populations and subgroups of those populations.

The fourth ally is the growing societal and political concern with the state of the *environment*—locally, regionally, and globally. There is not only increasing awareness of the environment's impact on the public's health, but recognition that the environment is probably the most malleable of all possible points for intervention. The potential for changes in our genetic heritage will remain limited, at least during the foreseeable future. Human behavior, unquestionably the most important factor to change, is also the most difficult. For some time we have known that occupational and general environmental hazards are major determinants of health status. The range of known factors extends from exposure to toxic substances, shift-work, and job insecurity, through air, water, food, radiation, and even visual and auditory pollution, to global warming. Social planning to modify and improve the *environment*, as well as to protect the vulnerable, should include the medical profession's active participation. This will undoubtedly require that medical schools redefine their missions to include study of the wide range of environments to which populations and patients are exposed.

The fifth ally is the *managerial era* now being imposed on virtually all health services; the days of the solo practitioner are over. The emphasis has shifted from concerns about "inputs" of resources and reports of "activities" such as numbers of visits to doctors, X-rays taken, and tests ordered to measures of results achieved based on medical audit, quality assurance, functional outcomes, and value for money. These changes have spawned new types of "corporate" practice that include group practices, health centers, consortia, networks, foundations, "systems," and other organizational configurations. Governments at all levels, as well as small clusters of practicing professionals, are now believed to require "managers" responsible for deploying resources and assessing clinical and financial performances. Their activities, in turn, are guided and governed by relatively new fields such as health services research, health systems research, clinical epidemiology, technology assessment, medical audit, outcomes research, and cost–benefit, cost–effectiveness, and decision analyses. All these use quantitative methods and population-based concepts. All are concerned with greatly increased professional accountability and what the seventeenth-century Oxford Professor of Anatomy, founding father of epidemiology and economics, Sir William Petty (1623–1687), called "political arithmetic."

In this new era the individual practitioner no longer has access to unlim
ited resources and unexamined professional freedom. Rules, regulations, publi
accountability, supervision, and management—all based on "informa
tion"—now define and constrain the environment in which physicians wi
operate in the future. If medical graduates are to participate responsibly i
both shaping this climate and cooperating effectively with colleagues in th
managerial era, medical schools will have to redefine their missions. Fo
responding to society's calls for help they will need to guide the medica
enterprise by means of continuing assessment of the population's health sta
tus and priorities.

V. Conclusions

These five developments, accompanied by renegotiation of medicine's soci
contract with the public, have great potential for expanding the perspective
of the biomedical sciences. They will also alter the contemporary paradig
constraining the profession's vision. This, in turn, requires medicine to e
pand its horizons to encompass not only cells, organs, and individual p
tients, but entire populations and the circumstances in which they live, b
come ill, recover, or die. This new vision will need to be shared wide
among physicians, administrators, politicians, and society as the medic
school proceeds to redefine its mission. Cooperation among all the interest
parties is a prerequisite for achieving balanced and integrated systems
medical education, research, and services. Without such vision and coo
eration, fragmented, divergent, and unbalanced strategies for all three m
dalities are likely to persist, thereby obstructing appropriate professional r
sponses to the full array of society's health needs.

For example, in the United States, and to a lesser extent in Canada, the
is growing awareness that the imbalance between generalists and specialis
limits the access of all citizens to early, compassionate, science-based, co
effective care. Many more appropriately trained general physicians are r
quired to sort out patients' initial symptoms and complaints. These phy
cians should be competent to manage 90–95% of the initial problems p
sented to them without resorting to costly and often unproducti
investigations. There is critical need for earlier recognition of such comm
conditions as potentially chronic or disabling cardiac and respiratory d
orders, accident proneness, masked depression, and childhood behavio
problems. Countless visits involve somatic complaints—backaches, hea
aches, and other musculoskeletal disorders—that, more often than not, ha
some association with psychological, occupational, or domestic stress
quiring early attention. Loneliness, alcoholism, drug dependency, child abus
sexual ignorance and dysfunction, to name the more commonplace, abou
in general populations. Both the appropriateness of training and the rat

of generalists to specialists determine the profession's capacity to respond to such problems.

In Australia and the United Kingdom, where the general practitioner is the backbone of the National Health Service, the ratio of generalists to specialists is about three to one; in the United States the situation is the reverse; and in Canada it is about one to one. In all four countries, the attitudes of faculty members, the teaching venues, the content of education, and the conceptual context in which education, research, and care take place determine the mix of doctors entering the profession's ranks each year. Every medical school will be faced with questions about its priorities for educating generalists *vis-à-vis* specialists—and then for determining the mix of specialists. Political and governmental incentives—often financial—for training generalists and help from the media to enhance their image could help to shift the distribution dramatically. But in all this a resort to population-based information should enlighten the debates and inform these decisions as the medical school redefines its mission.

What then is the mission of the medical school? It was Albert Einstein who observed that the greatest difficulty confronting the twentieth century revolved around the persistent ambiguity of our "goals" even as we perfect the "means" to achieve them. Preoccupation with mechanisms of disease and the processes of health care, particularly the advent of each new technology, seems to overshadow the ability to set goals designed to meet the public's needs. Fresh ways of thinking about the problems and new institutional and individual competencies will be demanded of both faculty and students. Recognition of the population's needs provides the justification for Chapters 7 and 8 and their specific proposals for redefining the mission of the medical school to encompass concerns for the entire population's health.

Rudolf Virchow (1821–1902) asserted that "medicine is a social science, and politics nothing but medicine on a large scale." Redefining the mission of the medical school will require political activity—in the best sense of the term—on several fronts. This includes medical school politics, as well as local and national politics. Individual medical schools can take initiatives to prepare and promulgate specific mission statements; public pressure through the media can be brought to bear on those institutions that fall short of societal expectations; political and governmental influence can be directed toward achieving the shared vision that is essential for success. Leverage also can be exerted through institutional requirements set by bodies such as the General Medical Council in Britain, the Accreditation Committee of the Australian Medical Council, and the Liaison Committee on Medical Education of the American and Canadian Medical Associations, the Association of American Medical Colleges, and the Association of Canadian Medical Colleges. In addition to the latter two organizations, the National Board of Medical Examiners in the United States, all the Royal Colleges in Britain, Australia, and Canada, and the various medical specialty boards and societies can set examination and entrance requirements that ensure the attainment of specified competencies. Finally, the British Parliament, the Australian, and Canadian Parliaments and the respective State and Provincial Legislatures, the United States Congress and State Legislatures can hold hearings, legislate, and use the power of the purse. In all of this, medical schools should remember that in every previous renegotiation of the social contract with the profession, society has always won. There is every reason to believe that in resolving the problems and issues we have raised, society will win again.

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Discussion

David S. Greer

"Redefining the Mission of the Medical School" is a call for revolution in Canada, the United Kingdom, the United States, and Australia. Its strength is in the accurate and incisive identification of current problems; its weakness is in the forces it identifies as available for the struggle against the formidable defenders of the status quo. In the final analysis, it relies on the rationality and civility of the establishment that, in the presence of better information and improved communication, will see the error of its ways and reform from within; history provides little support for such optimism.

The historical review that comprises the first half of the chapter apparently inspires confidence in the authors that the time is now ripe for change. I find it depressing; it is an account of opportunities shunned, pressures resisted, and humanitarian needs ignored by a self-centered academic-professional elite. I find no basis for the authors' statement that, "Realistically, medical schools today have little choice but to respond constructively to the population's needs." Indeed, a broad view of the profession in 1990 reveals little consensus on the role of academic faculties and practitioners in addressing those needs. Some argue that the problems are fundamentally economic, social, cultural, or political and therefore outside the purview of medicine; education in these areas is often regarded as "political" or ideological and therefore inappropriate in an "objective" scientific community.

It is therefore significant that the authors omit political or economic pressure from their list of potential solutions and rely, instead, on "contemporary developments" that they perceive as "allies in the urgent quest for needed change." To me, they appear to be weak allies, if indeed they are allies at all.

The Information Revolution has certainly expanded and improved the population database. But sufficient information to document societal need has existed for decades without substantial response from the academic or professional sectors. Self-interest has generally triumphed over communal altruism, as it does in most human endeavors.

Improved communication, the authors' second ally, is a two-edged sword: trumpeting the latest "miracle cure" derived from reductionist biological research may more effectively mobilize the support of the masses than appeals to their communal instincts, particularly in these days of relative atrophy of the latter tendencies.

It seems odd to me that authors' count molecular biology as an ally. Granted its value, I had always thought of it as the enemy, not to be destroyed but rather to be constrained. To make molecular biology an ally, somewhat strained second-order thinking is required that relates it to societal issues. I have detected no tendency to such extension of the field among molecular biologists or its advocates. Similarly, the interest of the academic community in environmental issues, the authors' fourth ally, has been primarily focused on biological aspects; there is a notable absence of career physicians in environmental programs and advocacy agencies, and the environment is almost totally unrepresented in medical school curricula except as it relates to disciplinary interests, e.g., passive exposure to tobacco smoke in cardiology and pulmonology.

Finally, the managers of health services that I know have minimal interest in "population-based concepts," except as they may affect market share and profit. Managers, by definition, make neither policy nor revolutions. They respond to the needs of their sponsors, in this case the profession, and at best they compromise those needs only as a means to the achievement of their sponsors' ends; thus, the focus on consumer satisfaction as important to the welfare of the providers.

I do not fault the authors for their reluctance to face the unpleasant and inevitably stormy consequences of their call for revolutionary change. It is difficult to develop successful revolutions, to feel confident that the strenuous methods required will produce the desired improvements rather than chaos and retrogression. Despite the authors' assertions to the contrary, this may be a particularly bad time to effect radical change in our four countries: the dominant mood seems egocentric, individualistic, complacent, and antirevolutionary to many observers. Where will the self-sacrificing leadership come from? In Leon Eisenberg's words, "Rudolf Virchow: Where Are You

w That We Need You?" How does one generate successful revolutions
dedicated revolutionaries? And, if those appeared, would they inspire
righten us?

nn D. Hamilton

aham Flexner in his report on Medical Education in the United States
Canada spent much of his time establishing the prime importance of a
ntific foundation for medical education, for the involvement of teachers
esearch, and for students to learn from the direct experience of the care
patients in teaching hospitals. Then right at the end of the section on the
per basis of medical education he extends the scope of a doctors' role in
interesting commentary:

> ntific progress has greatly modified his ethical responsibility. His relation was
> nally to his patient—at the most to his patient's family; and it was almost al-
> ther remedial . . . but the physician's function is fast becoming social and pre-
> ive, rather than individual and curative. Upon him society relies to ascertain,
> through measures essentially educational enforce, the conditions that prevent
> ase and make positively for physical and moral well-being. It goes without say-
> hat this type of doctor is first of all an educated man.

ve, on occasions, used that 1910 quotation without at first defining its
ee. It has been acclaimed as a fine and modern perception of medicine.
White and Connelly have correctly identified several new spheres of learn-
and technology that underpin an expansion in the role of medicine to
health of the population. The new role has some affinity with the role
ned by Flexner. While this volume has to do with the role of the medical
ool, that is subservient to the role of medicine and of doctors within it.
here is necessarily a major challenge:

> ne reorientation and expansion of the scope of medicine has to confront
> e issue of whether all of these new skills can be encompassed within a
> ngle profession. Alternatively, should the profession develop streams of
> pertise not only in final career paths (itself poorly developed and a prob-
> m in its own right) but also in the undergraduate sphere. We are familiar
> ith selective experience through electives, but by and large medicine has
> ack to the principle that there is one comprehensive, basic medical ed-
> cation. There are exceptions: for instance the People's Republic of China
> ains a Public Health doctor in parallel with a clinical doctor. Unfortu-
> ately the Public Health doctor is regarded as second best and the same
> ight happen to a Population Health doctor. But it might be managed
> herwise by admissions criteria, career path, and distinction of the degree.
> hile doctors may well need an awareness of management, information
> ience, health statistics, and health economics, should they become ex-
> rts in these fields? It is more likely that other professions will carry the

> main burden of the technical, if not the policy, roles built on these disciplines. So should there be an interlocking between the training of those professions and the training of doctors? We talk about this as between the traditional health professions although we do not make much of a fist at it. If we are to attempt the same with this much broader sweep of professions we will have to build quite different links within our universities. The World Health Organization called for universities to play a comprehensive role in primary health care, recognizing the importance of management, environmental sciences, and the social sciences. The list of professions and disciplines relevant to health and welfare is almost endless. If well-founded and sufficient medical education were to require both interrelations with the other professions and also a substantial academic base and practical experience in these wider fields then the length of the course, the complexity of relations with other disciplines and the size and profile of the medical faculty would have to expand greatly. Flexner stressed the need to go to the reality of experience to learn medicine—to the laboratory and bedside. So for these wider fields, students would need comparable experience in management information systems and the analysis and change of the physical and social environment of society. Both the academic and the logistic requirements of this are enormous and for small schools the resources may just not be available. Flexner consigned many small schools to the wall for just that reason.

- The authors speak of the opportunity of medicine to seize again a leadership role. Perhaps they have underestimated the role of those outside of the profession in the shaping of medicine. Abraham Flexner, Aneurin Bevan, and Florence Nightingale are striking examples. Maybe our consciousness of our professional role and its tendency to introversion stops us from liberating ourselves for the future.
- We may have become hidebound by our prescriptions for a basic medical qualification and its preparation for the gate-way internship. Should we be more creative and seek the appropriate background for these new roles in Population Health. Perhaps we should look to select for medical school those who already have management and other basic experience. Or perhaps we should reorder the sequence of medical education. The challenge of real management and real data analysis occurs only after a graduate has taken responsibility for patients. Maybe that is the time to concentrate on the new skills; and not just for those going into medical administration but for all doctors irrespective of their individual professional aspirations.
- And that leads to a final point that all plans will wither if there is not a clear-cut career pathway or a career profile that will allow these new skills and priorities to be realized. Careers must include academic as well as service careers and they must be founded on intensive research and scholarship. These are the old principles of Flexner brought to a new context. Perhaps if he had more time, he may have written this himself.

David A. Shaw

None will argue with the general thrust of the statement by the authors of this chapter. None will deny that the medical profession has an obligation to meet as best it may the needs of the society that it serves and by which it is supported. In teasing out the threads of the arguments on which the statement is based it is important that its coherence should not be diminished. But it raises a number of interesting and fundamental questions that are worthy of exploration. Some relate to definitions and divisions of responsibility and others to educational concepts and principle.

It is self-evident, although readily forgotten, that the quality of tomorrow's health services will depend in large measure on the students of today—on their selection, their education, and their attitudes. It will depend also on the scope and success of today's research, much of it undertaken in or in association with medical schools, and its translation into the clinical practice of tomorrow. The responsibility of the medical schools is thus paramount and the need for them to respond to the changing circumstances and expectations of society is undeniable. But their capacity to take responsibility for the political and financial manipulation of social change is less certain and probably differs in the four countries. In the United Kingdom the setting of priorities in health care and the allocation of resources are the business of the National Health Service (NHS) rather than the faculties of medicine and the NHS has a major role in the funding of postgraduate and continuing medical education. That is not to deny the growing recognition of the importance of a firm partnership between the NHS and the medical schools both in educational matters and in service provision.

Of more fundamental importance is the view that a medical school takes of itself as a seat of learning for the promotion of scholarship, for the encouragement of liberal and creative thinking, and for the provision of opportunities for curiosity-led research. Education that is utilitarian, emphatically vocational, and sensitive to short-term manpower requirements does not reflect the traditional concepts of a university. These concepts are, of course, under serious threat and at least partial surrender to pragmatism and commercialization has been inevitable.

As regards research, while there is much to be said for the development of a strategic approach to research in methods of health service provision, the notion of directed research in other areas is highly controversial. In such a program, it is possible that the benefits of molecular biology, rightly seen as a contemporary development of outstanding importance, might have eluded us.

Implicit in the argument for a more "population-based" medical education is a plea for increased emphasis on prevention. Attention is drawn in the chapter to the relative neglect of epidemiological research and it is justifiably attributed to the counterattractions of other areas of science, many involving

exciting and challenging technological developments. There are the additional reasons that epidemiological research is often slow in its returns and problems of funding may prove a disincentive. But perhaps more important is the uncertainty of outcome in terms of practical application. Some would argue that interventions are justifiable only when the experimental evidence on which they are based is beyond dispute and their effectiveness is clearly demonstrable. Such high standards of proof are not required by all and some would justify the introduction of prevention programs on "the balance of probability" in the belief that scientific certainty is seldom if ever achievable. There is the added deterrent that in our present state of knowledge success in bringing about change in patterns of human behavior in absence of immediately obvious gain is highly problematical. Controversies in the field of coronary heart disease prevention and in various screening programs illustrate these dilemmas.

There can be no argument about the need for medical education to become more aware of and receptive to the needs of sufferers from a wide range of conditions, many of them stress-related and hitherto regarded as banal. The combination of ignorance of their mechanisms and inadequacy in their management has led to a lamentable degree of neglect by the medical profession and the flourishing of therapeutic programs administered by others. The manipulation of populations, however, raises problems of a different order and when the initiative comes from the doctor rather than the patient, the ancient injunction *primum non nocere* is surely paramount.

General Discussion

There was agreement that are too many mismatches between what medical schools do and what is needed or expected by society with respect to health services and the mixes of physicians. The roles of medical schools should be understood within the broad context that includes all the health professions (including medicine), the health care system, societal trends and values, and the prevailing political arrangements. Although there are substantial differences among the four countries, there appeared to be common goals, and even means, that are applicable to most of their medical schools. The mission of the medical school requires redefining but of greater importance than what we *say* is what we *do*; this imbalance should be addressed.

There was less agreement about the need for *all* medical schools to undertake a major commitment to assuring that all faculty members and students appreciate the *population perspective*. Perhaps only some should do this; but who is to say which should and which should not? Is there a set of "core competencies" bearing on the population perspective that should be required of *all* medical graduates, or just of some? How realistic is it to expect all physicians to undertake all the roles proposed for them?

Do medical schools have within themselves, the energy, motivation, and capacity to undertake needed changes or must the impetus, even demand, come from external social, economic, and political forces? How broad a mandate should medical schools assume, in addition to being the "filter" for selection and preparation of future physicians? For example, should the faculty assume responsibility for influencing physician payment systems to achieve better balance in the provision of health services?

Several suggestions for facilitating both local and more general changes were advanced:

- Establish or negotiate social contracts with defined communities; learn from the experience of institutions around the world that have done this;
- Undertake an institutional self-study that requires discussion of input from a broad range of "stakeholders" including community leaders, government officials, students, professional organizations, voluntary agencies, consumers' groups, patient advocates, etc.;
- Systematically examine the mechanisms by which a continuing "dialogue with the community (ies)" can best be undertaken using pilot projects, board memberships, councils, and exchanges of experience;
- Establish sustainable and dynamic interactive "partnership systems" involving the medical school (and the university), informal and formal community leaders, and governmental agencies for developing and monitoring an agenda for population-based research and cooperative service activities. These partnerships could be a vehicle for influencing the medical curriculum;
- Dedicated funds could be sought for innovative interdisciplinary research bearing on high priority health problems in the community and for educational experiments related to societal needs and expectations;
- Faculty development programs are needed to prepare present and future medical faculty members with the "new skills" required for such undertakings as: academic strategic planning, restructuring (social) organizations, becoming a constructive partner with communities and governments, etc., and curriculum planning to incorporate the population perspective and related skills; and
- Create opportunities for students, and especially faculty members, to work in community settings (sometimes referred to as "community-based experiential learning") and make this activity an integral part of the academic reward system.

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2
The Social Contract and the Medical School's Responsibilities

THOMAS S. INUI

I. Introduction

This is a chapter with a point of view. In brief, since medical care is a social good, medical schools have "social responsibilities" that can and should be manifest in their mission and activities. Our exploration of this thesis will begin with an examination of the origin of the medical school's mission in the notion of "social contract," go on to a description of the legitimate roles of physicians, ask next how (or if) we prepare physicians for these roles, and finally review the opportunities for (and sources of resistance to) mission-driven change in medical schools. I do not seek to denigrate medical schools. They are the communities in which I live and work. I admire their accomplishments as bastions of biomedical science and worry about the focus and quality of their other activities. These are the loving and serious criticisms of a native son.

II. The Medical School's Mission

The medical school's central responsibility is for the education of physicians. In this simple, declarative form the statement seems almost tautologic. Most of the physicians will go on to careers of medical practice, and a smaller proportion will devote themselves principally to research, teaching, or both. The cumulative experience of the past 50 years in medical science, medical education, and medical practice suggests that all, no matter what the dominant activities of their careers, need to be prepared for lifetimes of continued scholarship, since a considerable fraction of the body of knowledge and skills physicians acquire in medical school is subject to obsolescence and/or decay well before the end of their careers (Manning and DeBakey 1987).

Many would think this a too-narrow construct for the medical school's mission, however, particularly in North America where medical schools do